

NON-PUBLIC?: N
ACCESSION #: 9012100223
LICENSEE EVENT REPORT (LER)

FACILITY NAME: VERMONT YANKEE NUCLEAR POWER STATION PAGE: 1
OF 4

DOCKET NUMBER: 05000271

TITLE: Reactor Scram Due To Turbine Trip Caused By A Malfunction In the
Turbine Emergency Tripping System

EVENT DATE: 11/04/90 LER #: 90-015-00 REPORT DATE: 12/03/90

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: N POWER LEVEL: 94

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR
SECTION:
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:

NAME: DONALD A. REID, PLANT MANAGER TELEPHONE: (802) 257-7711

COMPONENT FAILURE DESCRIPTION:

CAUSE: B SYSTEM: TG COMPONENT: 33 MANUFACTURER: G080
REPORTABLE NPRDS:

SUPPLEMENTAL REPORT EXPECTED: NO

ABSTRACT:

On 11/4/90 at 0120 hours, with reactor power at 94%, while performing weekly testing of the Turbine Emergency Governor (JC*), a reactor scram occurred as a result of a turbine control valve fast closure signal. The turbine control valve fast closure signal was generated by the acceleration relay after operators removed a trip lockout from the Emergency Trip Valve. This operator action was taken based on Emergency Trip Valve position information later identified as erroneous due to a missing set screw on a collar in the turbine front standard linkage. Since the collar was not attached to the linkage, a spring was not able to act upon the linkage and the Emergency Trip Valve limit switch did not change state as the valve moved.

The plant was stabilized without incident following the transient and the turbine (TA) was placed on the turning gear at 0241 hours. The

turbine vendor (GE) assisted plant personnel in repairing and testing the malfunctioning linkage prior to restoring the turbine control system (TG*) to service. The reactor was returned to critical on 11/4/90 at 2222 hours. A procedure is being revised to provide additional operator actions to be taken if light indications are abnormal. Turbine outage maintenance is being expanded to include an inspection of similar locking collars and position indicating.

*Energy Information Identification System (EIIS) Component Identifier

END OF ABSTRACT

TEXT PAGE 2 OF 4

DESCRIPTION OF EVENT

On 11/4/90 at 0120 hours, with reactor power at 94%, while performing weekly testing of the Turbine Emergency Governor (JC*), a reactor scram occurred as a result of a turbine control valve fast closure signal. The turbine control valve fast closure signal was generated by the acceleration relay when operators removed a trip lockout for the Emergency Trip Valve, following weekly surveillance testing. This operator action was taken based on Emergency Trip Valve position information, later identified as erroneous due to a missing set screw on a collar in the turbine front standard linkage.

The turbine emergency tripping system (JC) contains a testable three way valve whose primary purpose is to provide turbine over-speed protection. When reset, the valve maintains main shaft pump hydraulic oil pressure on the entire turbine trip/control system, allowing the main stop valves and control valves to be opened and the acceleration relay to be reset. When tripped, the valve dumps oil pressure and causes all of the turbine valves go closed, thus shutting down the turbine.

While performing testing of the Turbine Emergency Trip Valve, the linkage which provides light indication (IT) in the control room did not function as designed and provided incorrect valve position information to operators. The test of the Turbine Emergency Trip System consists of the following steps:

1. bypass (lock-out) the trip feature
2. manually trip the valve from the control room
3. observe the trip occurs from light indication
4. reset the trip and verify the trip is reset from light indication
5. remove the trip bypass.

Due to a linkage malfunction, the operators did not receive position

indication that the manual trip had actually occurred. The limit switch that illuminates the lamp for trip indication also operates the lamp that illuminates when the trip is reset. During the performance of the test the reset lamp did not extinguish and the trip light did not illuminate. The operators realized that the indication was not as expected but had no reason to believe that the governor tripped during testing. An inoperable test trip solenoid circuit would have given the same position indications as seen during this event. The control switch was positioned to the reset position and held there momentarily, in an attempt to ensure the trip was reset. When the operators positioned the switch to the normal (not locked-out) position, the turbine tripped because the Emergency Trip Valve had not been successfully reset. The Reactor Protective System (RPS) (*JC*) received a turbine control valve fast closure signal which resulted in a reactor scram. All other equipment performed as designed during this event.

*Energy Information Identification System (EIIS) Component Identifier

TEXT PAGE 3 OF 4

The plant was stabilized without incident following the transient and the turbine was placed on the turning gear at 0241 hours. The turbine vendor (GE) assisted plant personnel in troubleshooting the problem and identified the missing set screw and locking collar on the Emergency Trip valve position indicating linkage. The malfunctioning linkage was repaired and the turbine control system was returned to service. The reactor was returned to critical on 11/4/90 at 2222 hours.

CAUSE OF EVENT

The root cause of this event has been attributed to the failure of the set screw and collar to operate as intended and resulted in incorrect operator information. Since the collar was not attached to the linkage, a spring was not able to act upon the linkage and prevented it from following the Emergency Trip Valve position. Therefore, the Emergency Trip Valve limit switch did not change state as the valve moved and this resulted in a lack of valve position indication in the Control Room.

Contributing Cause

A contributing cause to this event is that outage turbine maintenance does not specifically address inspection and maintenance of Emergency Trip Assembly position indicating actuator rods and linkages.

ANALYSIS OF EVENT

The events detailed in this report did not have adverse safety

implications.

1. When the turbine trip lockout was removed from the Emergency Trip Valve assembly and the trip signal was present, the Turbine Emergency Tripping System operated as designed and tripped the turbine.

2. The Reactor Protective System (JC) operated as designed and scrammed the reactor after receiving a turbine control valve fast closure signal from the acceleration relay.

3. All other safety systems responded as expected.

*Energy Information Identification System (EIIS) Component Identifier

TEXT PAGE 4 OF 4

CORRECTIVE ACTIONS

IMMEDIATE CORRECTIVE ACTIONS

1. Immediate corrective actions included recovering from the reactor scram utilizing appropriate plant procedures.

2. The turbine vendor (GE) assisted on-site identifying and correcting the Emergency Trip system malfunction. The collar and linkage was reconnected and the system verified operational.

3. The weekly surveillance interval for testing of the Turbine Emergency Governor was evaluated and it has been determined that a monthly surveillance interval is adequate.

LONG TERM CORRECTIVE ACTIONS

1. The Operations Department is revising their procedure to include additional actions to be taken when the Emergency Governor Test indications are not as expected.

2. The plant will expand outage maintenance to include an inspection of components associated with locking collars and position indicating linkages.

ADDITIONAL INFORMATION

There have been no similar events of this type in the past five years.

*Energy Information Identification System (EIIS) Component Identifier

ATTACHMENT 1 TO 9012100223 PAGE 1 OF 1

VERMONT YANKEE NUCLEAR POWER CORPORATION
P. O. BOX 157
GOVERNOR HUNT ROAD
VERNON, VERMONT 05354

December 3, 1990
VYV #90-380

U.S. Nuclear Regulatory Commission
Document Control Desk
Washington, D.C. 20555

REFERENCE: Operating License DPR-28
Docket No. 50-271
Reportable Occurrence No. LER 90-15

Dear Sirs:

As defined by 10 CFR 50.73, we are reporting the attached Reportable Occurrence as LER 90-15.

Very truly yours,

VERMONT YANKEE NUCLEAR POWER CORPORATION

Donald A. Reid
Plant Manager

cc: Regional Administrator
USNRC
Region I
475 Allendale Road
King of Prussia, PA 19406

*** END OF DOCUMENT ***
